



PLATE I.—MISSISSIPPI RIVER AND GORGE AT MINNEHAHA.
View looking upstream from mouth of Minnehaha Creek. St. Peter sandstone capped by Platteville limestone in bluff at left.



PLATE II.—MISSISSIPPI RIVER AND GORGE AT MINNEAPOLIS.
View from campus of the State University looking upstream toward St. Anthony Falls, concealed by the bridges. The lower dam and power house are seen under the bridges. The river above the falls is seen over the power house.



PLATE III.—EAST WALL OF THE MISSISSIPPI GORGE ABOVE WASHINGTON AVENUE BRIDGE, EAST MINNEAPOLIS.
St. Peter sandstone overlain by Platteville limestone, which is capped by glacial drift.



PLATE IV.—EAST WALL OF THE MISSISSIPPI GORGE BELOW WASHINGTON AVENUE BRIDGE, EAST MINNEAPOLIS.
St. Peter sandstone overlain by Platteville limestone which is capped by glacial drift. The escarpment and bench at the right are remnants of an old falls scarp of St. Anthony Falls.



PLATE V.—ST. PETER SANDSTONE IN CLIFF OPPOSITE MINNEHAHA.
The friability of the sandstone is shown by the loose sand at base of the cliff and its purity by its whiteness.

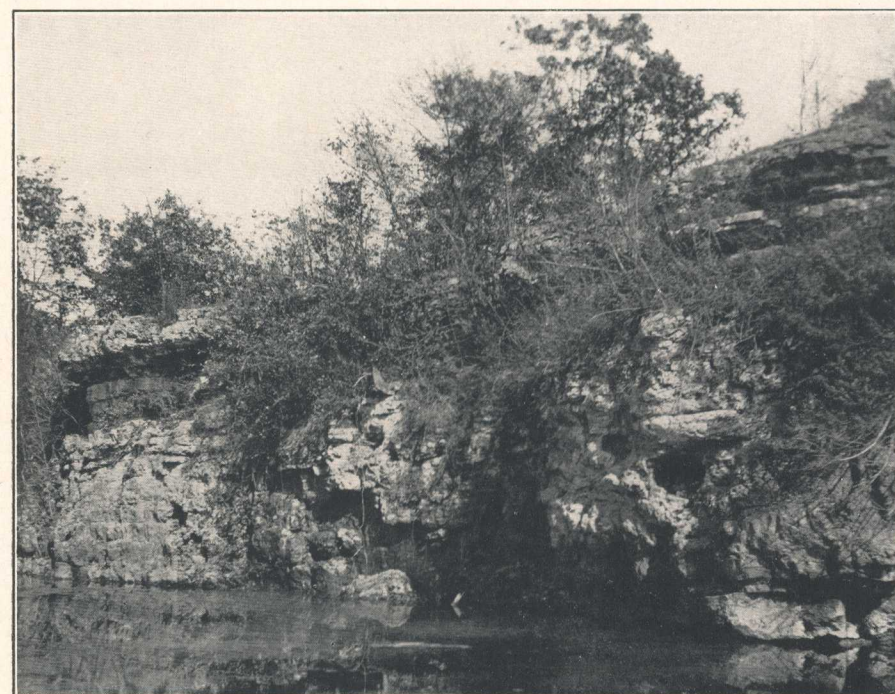


PLATE VI.—SHAKOPEE DOLOMITE IN CLIFF ON EAST SIDE OF MISSISSIPPI RIVER BELOW NEWPORT.
Shows the irregular bedding and the cavernous weathered outcrop of the formation.



PLATE VII.—CRYPTOZOON MINNESOTENSE, A CALCAREOUS MASS SECRETED BY ALGÆ IN SHAKOPEE DOLOMITE.
South of Inver Grove. Diameter of mass about 6 feet.



PLATE VIII.—MINNEHAHA FALLS.
The stream falls 63 feet over Platteville limestone capping St. Peter sandstone.



PLATE IX.—PLATTEVILLE LIMESTONE OVERLYING ST. PETER SANDSTONE, IN CLIFF OF MISSISSIPPI GORGE AT THE STATE UNIVERSITY.
The character of the lower limestones of the Platteville and the shale band at the contact with the St. Peter sandstone are well shown.

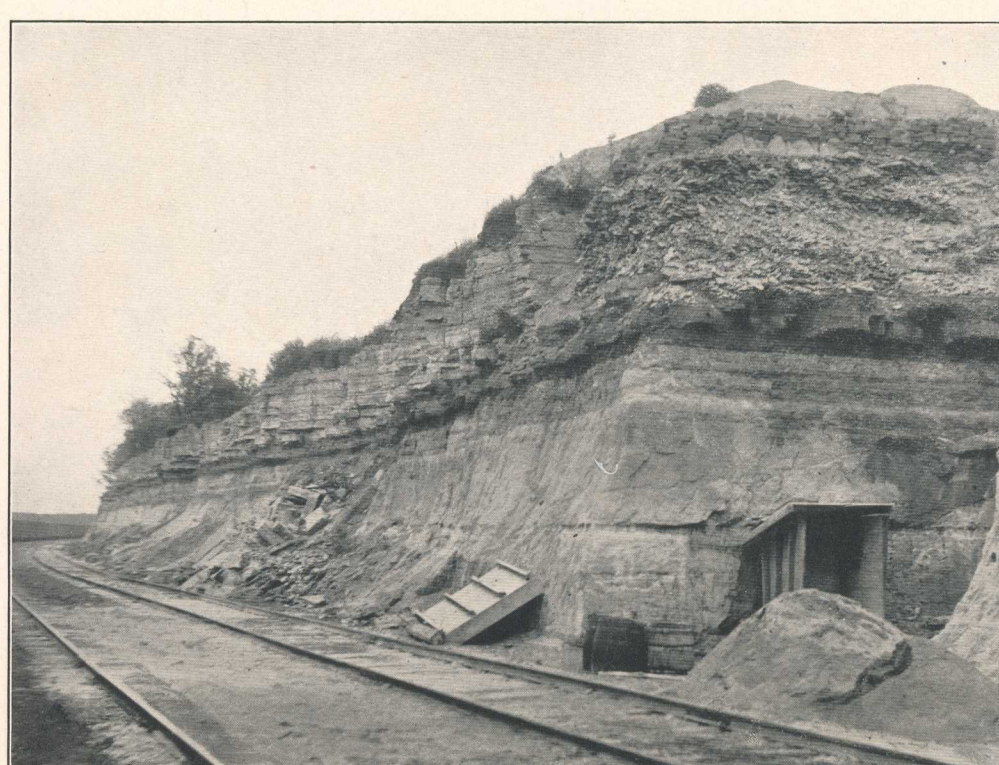


PLATE X.—UPPER PART OF ST. PETER SANDSTONE AND BASAL BEDS OF PLATTEVILLE LIMESTONE IN RAILROAD CUT IN ANOKA COUNTY NEAR NORTHTOWN, NORTHEAST MINNEAPOLIS.
The dark shale makes the contact very sharp.



PLATE XI.—DECORAH SHALE AND OVERLYING SHALY LIMESTONE OF THE GALENA IN QUARRY OF THE TWIN CITY BRICK CO. NEAR PICKEREL LAKE, ST. PAUL.
The shaly Galena limestone in the upper part of the cliff is overlain by Kansan drift.

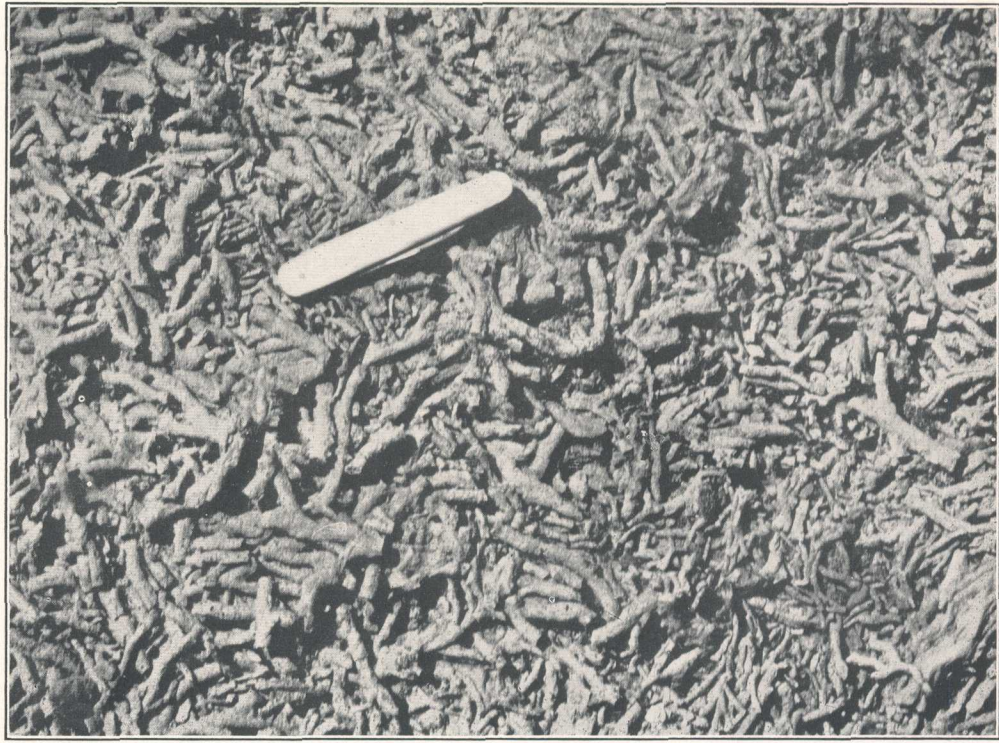


PLATE XII.—FUCOID BED NEAR TOP OF DECORAH SHALE, CHARACTERISTIC OF THE FORMATION IN THE AREA.
The fucoid stems are weathered in relief on the bedding surface.

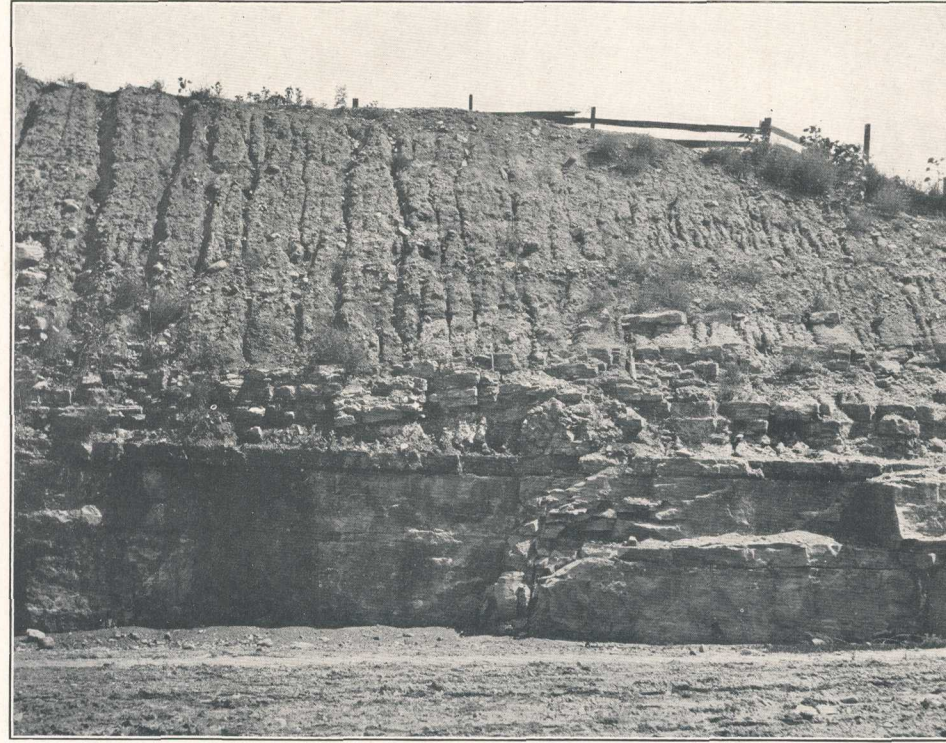


PLATE XIII.—BEDS OF DECORAH SHALE DISLOCATED BY THE ADVANCE OF THE ICE SHEET FROM THE LEFT.
In cut on boulevard at foot of State Street, Minneapolis. Layers of Decorah shale have been dislocated so that at the left they rest on undisturbed Platteville limestone, but at the right they lie on undisturbed Decorah shale. They are overlain by glacial till.



PLATE XIV.—SURFACE OF PLATTEVILLE LIMESTONE SMOOTHED AND GROOVED BY THE KANSAN ICE SHEET.
Quarry south of the State University, Minneapolis. The limestone is overlain by hard Kansan till.



PLATE XV.—RED OUTWASH SAND AND GRAVEL OVERLAIN BY WISCONSIN GRAY TILL, STATE UNIVERSITY CAMPUS MINNEAPOLIS.



PLATE XVI.—NEAR VIEW SHOWING DETAILS OF RED OUTWASH SAND AND GRAVEL SHOWN IN PLATE XV.



PLATE XVII.—INTERGLACIAL LAMINATED CLAY TILTED BY THE THRUST OF THE ADVANCING WISCONSIN ICE SHEET.
Overlain by river gravel. Clay pit at Northtown.



PLATE XVIII.—THIN SHEET OF WISCONSIN GRAY TILL OVERLYING A THIN SHEET OF WISCONSIN RED TILL WHICH RESTS ON RED GLACIAL SAND.
In sand pit on Snelling Avenue southwest of St. Paul. In the gray till there are white limestone pebbles and below it lies the red till, which is free from limestone pebbles and is streaked with lime leached from the gray till above.



PLATE XIX.—SOIL BANDS IN PLEISTOCENE DUNE SANDS ON STE. MARY'S AVENUE, PROSPECT PARK MINNEAPOLIS.



PLATE XX.—BLOCKS OF PLATTEVILLE LIMESTONE ON ERODED SURFACE OF ST. PETER SANDSTONE LEFT IN THIS POSITION AT FOOT OF RECEDING FALLS OF RIVER WARREN.
Exposed in railroad cut west of High Bridge, St. Paul.

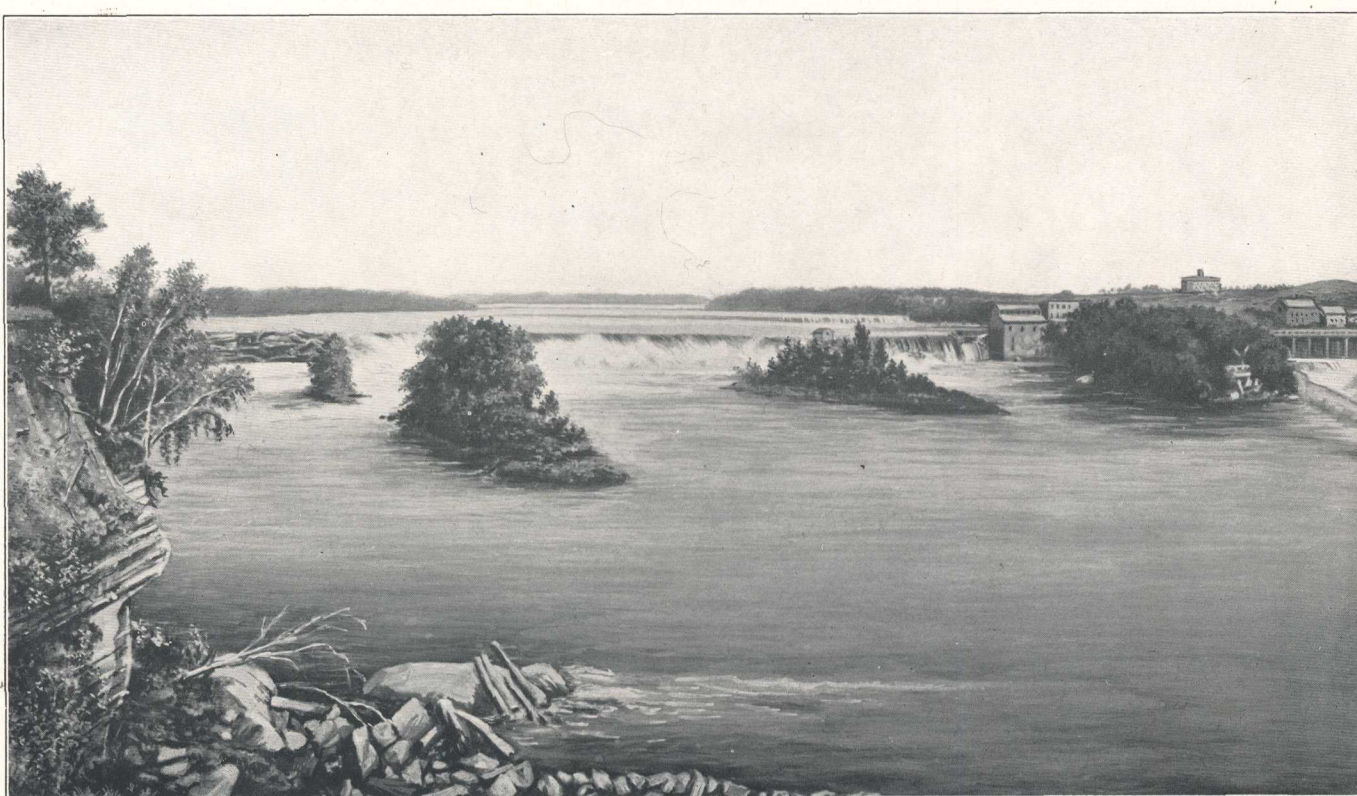


PLATE XXI.—GENERAL VIEW OF ST. ANTHONY FALLS IN 1857, SEEN FROM THE WEST BANK.
Shows Spirit Island, Cataract Island, and Hennepin Island, from left to right, below the falls. The middle part of the falls has receded 700 to 800 feet since this painting was made. From painting by Fred. Richardt. After N. H. Winchell, Minnesota Geol. and Nat. Hist. Survey, vol. 2, 1888.

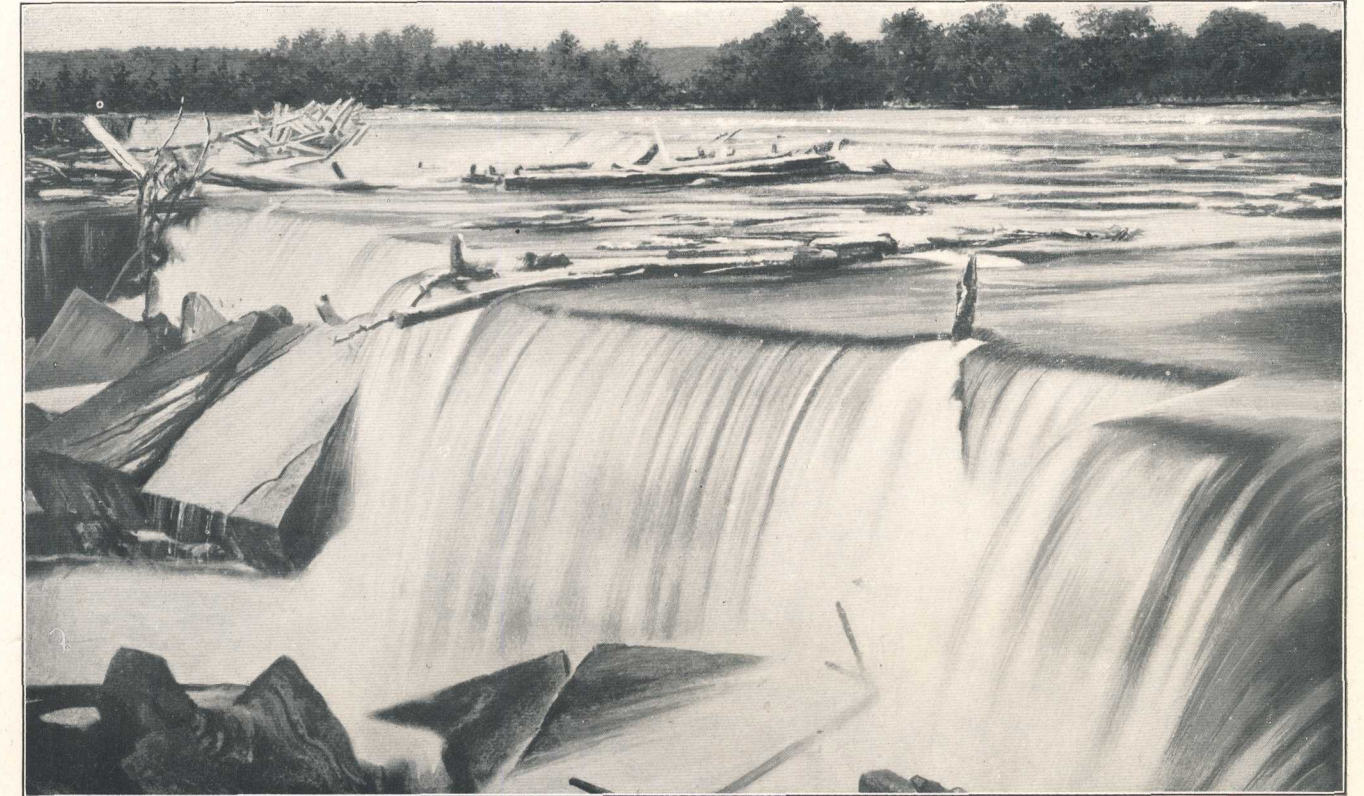


PLATE XXII.—ST. ANTHONY FALLS VIEWED FROM HENNEPIN ISLAND IN 1851.
The method of recession of the falls is shown by the angular blocks of Platteville limestone (formed by joint cracks) that have fallen from the crest. From daguerreotype by Alex. Hesler, Chicago. After N. H. Winchell, Minnesota Geol. and Nat. Hist. Survey, vol. 2, 1888.